

**Record: 1**

**Title:** Tides.

**Benchmarks:** Earth & Space Sciences -- Astronomy -- Study of the Universe

**Subject Terms:** TIDES; EARTH tides; OCEAN circulation; MOON -- Gravity; MATERIALS -- Effect of high gravity on; GRAVITATIONAL fields

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**Abstract:** Ocean tides on Earth are created by the gravitational pull of the Moon and the Sun. As the Earth spins, the tidal bulges seem to move around the world, creating two high tides every day. Spring tides are very high tides that happen when the Moon and the Sun are in line. Neap tides are small tides. Tides are also any upheaval created by the pull of gravity. Jupiter's moon Io undergoes huge tidal pulls. Whole galaxies can be pulled by the gravitational force of other galaxies. (Copyright applies to all Abstracts)

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### Tides

- **Ocean tides** are the twice daily rise and fall of the water level in the Earth's oceans.
- **Ocean tides on Earth are created** by the gravitational pull of the Moon and the Sun.
- **The Moon's pull creates** two bulges in the oceans: one beneath it and one on the opposite side of the Earth.
- **As the Earth spins**, the tidal bulges seem to move around the world, creating two high tides every day.
- **Spring tides** are very high tides that happen when the Sun and Moon are in line, and combine their pull.
- **Neap tides** are small tides that happen when the Sun and Moon are at right angles to the Earth and their pulls are weakened by working against one another.
- **The solid Earth has tides too**, but they are very slight and the Earth moves only about 20in (50cm).
- **Tides are also any upheaval** created by the pull of gravity, as one space object orbits another.
- **Moons orbiting** large planets undergo huge tidal pulls. Jupiter's moon Io is stretched so much that its interior is heated enough to create volcanoes.
- **Whole galaxies** can be affected by tidal pulls, making them stretch this way and that as they are tugged by the gravitational pull of other, passing galaxies.



*As the Earth spins beneath the Moon, its oceans and seas are lifted by the Moon's gravity into tides.*

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By John Farndon

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